

REMARKS

Claims 1-23 are pending.

On page 7 of the office action, the examiner mentioned that the previous amendments to the claims overcame all previous rejections of the claims. The examiner relies on new grounds for rejecting the claims. Specifically, the examiner newly cites U.S. Patent No. 3,643,964 to Snelling and combines Snelling with combinations of art that the examiner previously proposed and were overcome by amendments to the claims.

Applicants' Claim 1 recites an exit gas flow conduction technique for an ALD chamber "wherein varying the [ALD process] gas flow conductance comprises translating a feature substantially circumscribing a periphery of the substrate, forming a variable aperture." One embodiment of "translating" such a "feature" is shown in Fig. 13, where a shield 14 circumscribing a periphery of the substrate 8 is translated up and down to adjust the exit gas flow through a pumping channel 20 to a vacuum source (pages 19-23 of specification).

The examiner's previously cited art generally consisted of a process chamber using the Gruenwald (Pat. 5,009,738) rotary valve as a gas flow controller. The Gruenwald valve is shown in Gruenwald's Figs. 3 and 4. The Gruenwald valve is located above the substrate and rotates to align holes to form gas apertures. So the previous combination of prior art did not disclose the claimed limitation: "wherein varying the [ALD process] gas flow conductance comprises translating a feature substantially circumscribing a periphery of the substrate, forming a variable aperture." The examiner admits this deficiency in the prior art at the bottom of page 3 and the top of page 6 of the office action.

In an attempt to show the above-quoted limitation is obvious, the examiner relies on a crystal-growing pull rod taught by Snelling. The purpose of this pull rod is to very slowly pull a crystalline boule out of a melt while the rod is rotating (col. 2, lines 26-31). Col. 3, lines 20-28, provides a good summary of the pull rod action. The Snelling invention is to scrap off oxide impurities from the pull rod while not allowing the impurities to drop into the melt. To sweep away the scraped off impurities, the scraped off impurities fall into a small chamber 45 around the pull rod and are swept away by pressurized gas (argon) from

the furnace into the atmosphere. The gas flow for sweeping away the impurities is adjusted by manually turning an adjusting ring 63 to align sets of radial holes extending between the furnace and the atmosphere, thereby setting the flow of gas through the impurity chamber 45. The gas flow through the holes has nothing to do with the crystal growing process and is not intended to be varied once set by turning the adjusting ring 63 (col. 3, lines 13-14).

The Snelling pull rod could not possibly be combined with the previously cited prior art to render Applicant's claims obvious for **at least** the following reasons:

1. The Snelling pull rod is totally unrelated to varying a process gas flow conductance for a process chamber that deposits a material on a substrate, since the only function of the pull rod is to pull a boule out of a melt. The pull rod is not for varying a process gas flow.
2. The Snelling gas flow is fixed once set by turning "adjusting ring 63" and is unrelated to varying a flux of a deposition process gas, as recited in Applicants' Claim 1.
3. The Snelling radial holes that form an opening between the furnace and the atmospheres do not substantially circumscribe the periphery of any substrate (or anything else), as recited in Claim 1. The holes are external to the chamber and are adjacent to the pull rod.
4. Translating the Snelling pull rod has no effect on the gas flow.
5. There is no motivation to combine the Snelling pull rod structure with any deposition chamber, and the pull rod would destroy the function of the prior art deposition chambers.


Accordingly, the Snelling pull rod could not be combined with the prior art to render obvious Applicants' claims. Even if the Snelling pull rod assembly were used with the prior art process chambers, it would not have any of the features in Applicants' Claim 1, it would have no useful function, and it would destroy the function of the prior art deposition chambers.

If the examiner persists in the rejection of Claim 1 in view of Snelling, **the examiner**

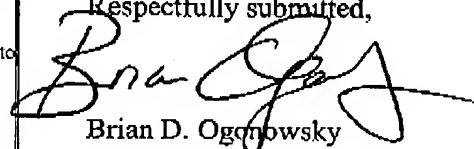
is requested to specifically address each of the issues raised above, including any motivation to combine the Snelling boule pull rod with an ALD process chamber.

The only other independent claims are Claims 19 and 20, which have a feature similar to that discussed with respect to Claim 1 above.

There are additional reasons for why the claims are allowable, but the above reasons are submitted to be sufficient to overcome the rejection. Accordingly, it is respectfully requested that the Examiner allow all claims. If the Examiner's next action is other than the allowance of the claims, the Examiner is respectfully requested to call Applicant's attorney at (408) 382-0480 x202.

| Certification of Facsimile Transmission | |
|--|--------------------|
| I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below. | |
| Signature  | Date <u>8/6/04</u> |

Respectfully submitted,


Brian D. Ogonowsky
Attorney for Applicant(s)
Reg. No. 31,988